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(71) Applicant (for all designated States except US): **THE UNIVERSITY OF AKRON [US/US]**; 302 East Buchtel Commons, Akron, OH 44325 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **CHUANG, Steven S., C.** [US/US]; 21 Nathan Court, Hudson, OH 44236 (US).

(74) Agent: **MOXON, George, W. II**; Roetzel & Andress, 222 South Main Street, Akron, OH 44308 (US).

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(54) Title: CARBON-BASED FUEL CELL

(57) Abstract: A direct-electrochemical-oxidation fuel cell and method for generating electrical energy from a solid-state organic fuel. The fuel cell includes a cathode provided with an electrochemical-reduction catalyst that promotes formation of oxygen ions from an oxygen containing source at the cathode, an anode provided with an electrochemical-oxidation catalyst that promotes direct electrochemical oxidation of the solid-state organic fuel in the presence of the oxygen ions to produce electrical energy, and a solid-oxide electrolyte disposed to transmit the oxygen ions from the cathode to the anode. The electrochemical oxidation catalyst can optionally include a sulfur resistant material.